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Applicant(s): P. Bonutti

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Application No.: 10/003,996

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Examiner: J. Baxter

For: APPARATUS AND METHOD FOR TISSUE  
REMOVAL

PENDING CLAIMS

36. A surgical procedure to be conducted on a patient, said surgical procedure comprising the steps of removing tissue from a first location in the patient's body, separating one or more components from at least a portion of the removed tissue, thereafter packing the removed tissue into a desired shape, and thereafter implanting the packed tissue at a second location in the patient's body, wherein the removed tissue includes blood and other body tissue.

37. A surgical procedure as set forth in claim 36 wherein said step of separating one or more components from the removed tissue includes centrifuging at least a portion of the removed tissue.

38. A surgical procedure as set forth in claim 36 further including the step of adding a substance to the removed tissue after separating one or more components from the removed tissue and prior to implanting the packed tissue at a second location in the patient's body.

39. A surgical procedure as set forth in claim 36 wherein said step of removing tissue from a first location in a patient's body includes cutting body tissue at the first location and moving the body tissue away from the first location under the influence of suction.

40. A surgical procedure to be conducted on a patient, said surgical procedure comprising the steps of removing tissue from a first location in the patient's body, separating one or more

components from at least a portion of the tissue removed from the patient's body, and implanting the tissue at a second location in the patient's body after separating one or more components from at least a portion of the tissue, wherein said step of removing tissue from a first location in a patient's body includes cutting body tissue at the first location and moving the body tissue away from the first location under the influence of suction and wherein said step of cutting body tissue includes rotating a cutting tool under the influence of force transmitted through an elongated member which is at least partially enclosed by a tubular member, said step of moving the body tissue away from the first location under the influence of suction includes moving body tissue cut by the rotating cutting tool along the tubular member under the influence of suction, wherein the elongated member is flexible such that the cutting tool can be guided.

41. A surgical procedure to be conducted on a patient, said surgical procedure comprising the steps of removing tissue from a first location in the patient's body, separating one or more components from at least a portion of the tissue removed from the patient's body, and implanting the tissue at a second location in the patient's body after separating one or more components from at least a portion of the tissue, wherein said step of implanting the tissue at the second location includes inserting a cannula into the patient's body, moving a surgical instrument through the cannula, removing tissue from the second location, said step of removing tissue from the second location includes using the surgical instrument inserted through the cannula, and, thereafter, performing said step of inserting tissue removed from the first location in the patient's body at the second location in the patient's body.

42. A surgical procedure as set forth in claim 36 wherein said step of separating one or more components from the removed tissue includes separating one or more components from blood removed from the patient's body, said step of implanting the packed tissue at a second location in the patient's body includes implanting one or more components of the blood removed from the patient's body.

43. A surgical procedure as set forth in claim 36 wherein said step of separating one or more

components from the removed tissue includes separating at least a first component from blood removed from the patient's body, said step of implanting the packed tissue at a second location in the patient's body includes implanting the blood removed from the patient's body after removing at least the first component from the blood and implanting at least a portion of the other body tissue removed from the patient's body.

44. A surgical procedure as set forth in claim 36 wherein said step of separating one or more components from the removed tissue includes removing at least a first component from the blood removed from the patient's body, and said step of implanting the packed tissue at the second location includes implanting at least the blood from which at least the first component has been removed.

46. A surgical procedure as set forth in claim 36 wherein said step of separating one or more components from the removed tissue includes filtering the blood and other body tissue removed from the first location, said step of implanting the packed tissue at a second location is performed after filtering the blood and other body tissue removed from the first location.

47. A surgical procedure as set forth in claim 36 wherein said step of separating one or more components from the removed tissue includes moving the blood and other body tissue removed from the first location into a trap, said step of implanting the packed tissue at a second location is performed after moving the blood and other body tissue removed from the first location into the trap.

49. A surgical procedure as set forth in claim 36 wherein said step of removing tissue from a first location in a patient's body includes inserting a first tubular member into a patient's body and moving the removed tissue from the first location in the patient's body through the first tubular member to a location outside of the patient's body, said step of implanting the packed tissue at a second location in the patient's body includes inserting a second tubular member into the patient's body and moving the packed tissue through the second tubular member.

51. A surgical procedure as set forth in claim 53 further including the step of separating one or more components from at least a portion of the body tissue moved through the first tubular member prior to performance of said step of moving body tissue through the second tubular member to the second location in the patient's body.

52. A surgical procedure as set forth in claim 53 further including the step of centrifuging at least a portion of the body tissue moved through the first tubular member to separated one or more components from the body tissue prior to performing said step of moving the body tissue through the second tubular member.

53. A surgical procedure to be conducted on a patient, said surgical procedure comprising the steps of inserting a first tubular member into the patient's body, moving body tissue from a first location in the patient's body through the first tubular member to a location outside of the patient's body, inserting a second tubular member into the patient's body, and moving at least a portion of the body tissue through the second tubular member to a second location in the patient's body, wherein a substance is added to the body tissue after moving the body tissue from the first location through the first tubular member to a location outside of the patient's body and prior to moving the body tissue through the second tubular member, and wherein the added substance is a bone growth promoter.

54. A surgical procedure as set forth in claim 53 wherein said step of moving the body tissue from the first location through the first tubular member includes moving the body tissue through the first tubular member under the influence of suction.

55. A surgical procedure as set forth in claim 53 further including the step of cutting body tissue at the first location with a cutting tool which is driven under the influence of force transmitted through the first tubular member.

56. A surgical procedure to be conducted on a patient, said surgical procedure comprising the steps of inserting a first tubular member into the patient's body, moving body tissue from a first location in the patient's body through the first tubular member to a location outside of the patient's body, inserting a second tubular member into the patient's body, moving a surgical instrument through the second tubular member, removing tissue from a second location with the surgical instrument, and moving at least a portion of the body tissue through the second tubular member to the second location in the patient's body.

57. A surgical procedure as set forth in claim 53 wherein said step of moving body tissue from a first location in the patient's body through the first tubular member includes moving blood from the first location in the patient's body through the first tubular member, said surgical procedure further includes separating one or more components from the blood, said step of moving body tissue through the second tubular member to the second location in the patient's body includes moving the blood from which one or more components have been removed through the second tubular member to the second location in the patient's body.

58. A surgical procedure as set forth in claim 53 wherein said step of moving tissue from the first location in the patient's body through a first tubular member includes moving blood and pieces of other tissue through the first tubular member, said surgical procedure further includes filtering the blood and other tissue moved through the first tubular member, said step of moving body tissue through the second tubular member is performed after filtering the blood and other tissue.

59. A surgical procedure as set forth in claim 53 wherein said step of moving tissue from the first location in the patient's body through a first tubular member includes moving blood and pieces of other tissue through the first tubular member, said surgical procedure further includes moving the blood and other tissue into a trap, said step of moving body tissue through the second tubular member is performed after moving the blood and other tissue into a trap.

60. A surgical procedure to be conducted on a patient, said surgical procedure comprising the steps of inserting a first tubular member into the patient's body, moving body tissue from a first location in the patient's body through the first tubular member to a location outside of the patient's body, packing tissue moved through the first tubular member to form a body of packed tissue, inserting a second tubular member into the patient's body, and moving the body of packed tissue through the second tubular member to a second location in the patient's body.

69. A surgical procedure to be conducted on a patient, said surgical procedure comprising the steps of cutting body tissue at a first location in a patient's body, moving blood and other body tissue along a first tubular member in a direction away from the first location in the patient's body to a location outside of the patient's body, separating one or more components from at least one of the blood and other body tissue at a location outside of the patient's body, thereafter, packing the blood and other body tissue to form a packed tissue mass, moving the packed tissue mass along a second tubular member in a direction toward a second location in the patient's body, and implanting the packed tissue mass at the second location in the patient's body.

70. A surgical procedure as set forth in claim 69 wherein said step of separating one or more components from at least one of the blood and other body tissue includes centrifuging the blood.

71. A surgical procedure to be conducted on a patient, said surgical procedure comprising the steps of cutting body tissue at a first location in a patient's body, moving blood and other body tissue along a first tubular member in a direction away from the first location in the patient's body to a location outside of the patient's body, separating one or more components from at least one of the blood and other body tissue at a location outside of the patient's body, thereafter, moving the blood and other body tissue along a second tubular member in a direction toward a second location in the patient's body, and implanting the blood and other body tissue at the second location in the patient's body wherein said step of separating one or more components from at least one of the blood and other body tissue includes centrifuging the other body tissue.

72. A surgical procedure as set forth in claim 71 wherein said step of separating one or more components from at least one of the blood and other body tissue includes centrifuging the blood.

73. A surgical procedure as set forth in claim 69 further including the step of adding a substance to the packed tissue mass prior to moving the packed tissue mass along the second tubular member.

74. A surgical procedure as set forth in claim 69 wherein said step of moving the packed tissue mass along a first tubular member includes moving the packed tissue mass under the influence of suction.

75. A surgical procedure as set forth in claim 69 wherein said step of cutting body tissue at the first location in a patient's body includes rotating a cutting tool under the influence of force transmitting through the first tubular member.

76. A surgical procedure as set forth in claim 69 further including the steps of moving a surgical instrument through the second tubular member and removing the tissue from the second location before moving the packed tissue mass along the second tubular member.